

FACT SHEET FOR NPDES PERMIT WA0023272
CITY OF RIDGEFIELD

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INTRODUCTION

The Federal Clean Water Act (FCWA, 1972, and later modifications, 1977, 1981, and 1987) established water quality goals for the navigable (surface) waters of the United States. One of the mechanisms for achieving the goals of the Clean Water Act is the National Pollutant Discharge Elimination System (NPDES) of permits, which is administered by the Environmental Protection Agency (EPA). The EPA has authorized the state of Washington to administer the NPDES permit program. Chapter 90.48 Revised Code of Washington (RCW) defines the Department of Ecology's (Department) authority and obligations in administering the wastewater discharge permit program.

The regulations adopted by the state include procedures for issuing permits [Chapter 173-220 Washington Administrative Code (WAC)], technical criteria for discharges from municipal wastewater treatment facilities (Chapter 173-221 WAC), water quality criteria for surface and ground waters (Chapters 173-201A and 200 WAC), and sediment management standards (Chapter 173-204 WAC). These regulations require that a permit be issued before discharge of wastewater to waters of the state is allowed. The regulations also establish the basis for effluent limitations and other requirements which are to be included in the permit. One of the requirements (WAC 173-220-060) for issuing a permit under the NPDES permit program is the preparation of a draft permit and an accompanying fact sheet. Public notice of the availability of the draft permit is required at least 30 days before the permit is issued (WAC 173-220-050). The fact sheet and draft permit are available for review (see Appendix A--Public Involvement of the fact sheet for more detail on the Public Notice procedures).

The fact sheet and draft permit have been reviewed by the Permittee. Errors and omissions identified in this review have been corrected before going to public notice. After the public comment period has closed, the Department will summarize the substantive comments and the response to each comment. The summary and response to comments will become part of the file on the permit and parties submitting comments will receive a copy of the Department's response. The fact sheet will not be revised. Comments and the resultant changes to the permit will be summarized in Appendix D--Response to Comments.

<u>GENERAL INFORMATION</u>	
Applicant	City of Ridgefield
Facility Name and Address	Ridgefield Wastewater Treatment Plant West Cook Street Ridgefield, Washington
Type of Treatment:	Activated Sludge
Discharge Location	Lake River Latitude: 45° 49' 18" N Longitude: 122° 45' 09" W.
Water Body ID Number	Old ID # WA-28-1010, New ID # 1220169456238

BACKGROUND INFORMATION

DESCRIPTION OF THE FACILITY

HISTORY

The Ridgefield sewage treatment system was originally constructed in 1959 and has undergone several upgrades since then. The latest upgrade began in 2000. The facility operation had difficulty prior to 2001 when it was discovered by the Department that some staff at the Ridgefield facility were falsifying discharge monitoring records. In the last two years staff have been replaced and the facility appears to be running smoothly.

COLLECTION SYSTEM STATUS

Most of the sewer collection system was installed in 1959 and consists mostly of 8-inch and 6-inch diameter sewer lines with a ten-inch trunk line that delivers wastewater to the treatment plant. There is approximately 26,000 feet of sewer lines in the city. Most of the sewers are constructed of concrete or asbestos cement pipe with rubber o-ring gaskets. The side sewers are constructed of concrete pipe with cold-packed bitumastic joints.

There are two collection system pump stations that serve low elevations adjacent to Lake River and another lift station located in Abrams Park. These lift stations are small serving less than 20 homes. The rest of the system is gravity flow with a lift station located at the treatment plant to provide gravity flow through the plant.

There is a separate collection system for the high school and an adjacent subdivision. These separate systems are not owned and maintained by the city, which can present problems when routine maintenance and solving inflow and infiltration problems. This separate system includes two pump stations in series. The upper pump station serves the high school and is owned by the Ridgefield School District. This separate collection system is connected to the City of Ridgefield's system by 12,000 feet of force main. The school collection system was built in 1977 and the subdivision collection system was constructed in 1992.

The Port of Ridgefield industrial park has an 8-inch gravity sewer that flows to a pump station and 12,000 feet of force main to the City system. This same pump station serves the golf course facilities and a Washington State Department of Transportation (WSDOT) weigh station.

TREATMENT PROCESSES

The City of Ridgefield uses an activated sludge system followed by secondary clarification and UV-disinfection. A schematic may be found in Appendix C. In more detail, the effluent is first screened at the head works with a centrifugal grit removal system followed by both a HYCOR rotating screen and a floating grease/particle separator. Solids removed with these processes are sent to a dumpster. There is a Parshall flume with an ultrasonic flow meter in this area of the plant along with a 24-hour refrigerated sampling station. Flow enters a selection chamber before entering one of two activated sludge tanks. The selection chamber can have aeration on or off for part of the tank with the aim of increasing food to mass ratio in the selector. The activated sludge tanks are used one at a time for a period of approximately one year while the other tank serves as a backup aeration tank. The flow then enters the one main secondary clarifier. An old clarifier attached to the aeration tanks serves as an emergency back-up. Flow enters a

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UV-disinfection channel. There are three banks of UV lights, but only one bank is needed under normal flow. There is another Parshall flume with an ultrasonic flow meter in this area of the plant along with a 24-hour refrigerated sampling station.

There are no industrial users of the system. There are some commercial users at the Port, however, they discharge only domestic sewage from toilets to Ridgefield's system. The town has three restaurants that discharge to the treatment plant. All of the restaurants have grease traps.

The facility is classified as a level II plant which requires an operator of at least level II certification to be in charge of daily operations and operators of level I to operate the plant. There are two operators with level II certification, and one operator with level I certification. The facility is staffed 7:30 a.m. -4:00 p.m., Monday through Friday, with staff on call 24 hours per day and on the weekends.

At this time the State Revolving Fund Loans has been closed out and no other loans or grants are pending.

DISCHARGE OUTFALL

Secondary treated and disinfected effluent is discharged from the facility via a ten-inch outfall into Lake River which is a tributary to the Columbia River. There is no diffuser on the outfall.

RESIDUAL SOLIDS

The treatment facilities remove solids during the treatment of the wastewater at the headworks (grit and screenings), and at the secondary clarifiers, in addition to incidental solids (rags, scum, and other debris) removed as part of the routine maintenance of the equipment. Grit, rags, scum, and screenings are drained and disposed of as solid waste at the local transfer station. Solids removed from the clarifier (including biosolids) are treated in aerobic digesters for thickening and then are trucked to the Salmon Creek WWTP. The Salmon Creek facility land applies biosolids after further treatment.

PERMIT STATUS

The previous permit for this facility was issued on August 12, 1998. The previous permit placed effluent limitations on five-day Biochemical Oxygen Demand (BOD₅), Total Suspended Solids (TSS), pH, Fecal Coliform bacteria, total residual chlorine, and ammonia.

There were several requirements in the previous permit that were never completed. These requirements included conducting a receiving water study, and securing an outfall corridor to the Columbia River. The Permittee has had difficulty in getting permission to cross the wildlife refuge in order to reach the Columbia River as required under the 1998 permit. Because the previous permit anticipated an outfall to the Columbia, a receiving water study in Lake River was not required.

An application for permit renewal was submitted to the Department on February 5, 2003, and accepted by the Department.

SUMMARY OF COMPLIANCE WITH THE PREVIOUS PERMIT

The facility received its last compliance inspection on April 29, 2003. No samples were taken at that time, however, the facility operations and paper work were thoroughly examined. The facility was in good operating condition. A few minor changes were recommended by the inspector.

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WASTEWATER CHARACTERIZATION

During the history of the previous permit, the Permittee has not remained in compliance, based on Discharge Monitoring Reports (DMRs) submitted to the Department and inspections conducted by the Department. However, during the last 17 months with upgrades to the plant, new operation and management, the facility has been mostly operating within limits. Therefore, the characterization table shown below only includes data for the 17 month period from November 2001 to March 2003.

Table 1: Effluent Characterization

Parameter	Averages, 95th Percentiles or Maximum/Minimums	Effluent Limits from 1998 Permit
Flow	0.297 mgd (avg of monthly maximums)	0.5 mgd maximum monthly design flow
pH	6.4 min, 7.5 max	6.0-9.0 limits
Fecal coliform	4/100 ml (95 th percentile of monthly geomean) 39/100 ml (95 th percentile of weekly geomean) 66/100ml (maximum)	200/100ml monthly 400/100ml weekly
BOD	5 mg/L avg of monthly maximums	30 mg/L avg monthly 45 mg/L avg weekly
TSS	6 mg/L avg of monthly maximums	30 mg/L avg monthly 45 mg/L avg weekly
Ammonia	0.586 mg/L 95 th percentile of all summer months in 2000	Optimize plant operation for nitrification and monitor

The flow has been kept below the maximum monthly design flow of 0.5 mgd. An average of the monthly maximum flows was 0.297 mgd. The minimum and maximum pH never violated limits. The fecal coliform was kept well within limits with the use of the new Ultra-Violet (UV) disinfection system. BOD and TSS concentrations were both kept very low. The average of the monthly maximums was 5 mg/L for BOD and 6 mg/L for TSS, whereas the monthly and weekly limits were 30 mg/L and 45 mg/L respectively. The Ammonia was kept below 0.586 mg/L 95 percent of the time. Because the limit for ammonia was narrative, the determination of whether ammonia was a problem will be covered later in this fact sheet. Ammonia will be compared to background in the reasonable potential analysis.

No other toxics were noted in the effluent. No metals have been examined in the past but may be required in the future.

PROPOSED PERMIT LIMITATIONS

Federal and state regulations require that effluent limitations set forth in a NPDES permit must be either technology- or water quality-based. Technology-based limitations for municipal discharges are set by regulation (40 CFR 133, and Chapters 173-220 and 173-221 WAC). Water quality-based limitations are based upon compliance with the Surface Water Quality Standards (Chapter 173-201A WAC), Ground Water Standards (Chapter 173-200 WAC), Sediment Quality Standards (Chapter 173-204 WAC) or the

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National Toxics Rule (Federal Register, Volume 57, No. 246, Tuesday, December 22, 1992.) The most stringent of these types of limits must be chosen for each of the parameters of concern. Each of these types of limits is described in more detail below.

The limits in this permit are based in part on information received in the application. The effluent constituents in the application were evaluated on a technology- and water quality-basis. The limits necessary to meet the rules and regulations of the state of Washington were determined and included in this permit. The Department does not develop effluent limits for all pollutants that may be reported on the application as present in the effluent. Some pollutants are not treatable at the concentrations reported, are not controllable at the source, are not listed in regulation, and do not have a reasonable potential to cause a water quality violation. Effluent limits are not always developed for pollutants that may be in the discharge but not reported as present in the application. In those circumstances the permit does not authorize discharge of the non-reported pollutants. Effluent discharge conditions may change from the conditions reported in the permit application. If significant changes occur in any constituent, as described in 40 Code of Federal Regulations (CFR) 122.42(a), the Permittee is required to notify the Department. The Permittee may be in violation of the permit until the permit is modified to reflect additional discharge of pollutants.

DESIGN CRITERIA

In accordance with WAC 173-220-150 (1)(g), flows or waste loadings shall not exceed approved design criteria.

The design criteria for this treatment facility are taken from 1997 Facility Plan for the facility by Wallis Engineering and are as follows:

Table 2: Design Standards for the Ridgefield WWTP.

Parameter	Design Quantity
Monthly average flow (max. month)	0.5 MGD
Monthly average dry weather flow	Not Available
Instantaneous peak flow	1.50 MGD
BOD ₅ influent loading (max. month)	1,083 lbs/day
TSS influent loading (max. month)	1,083 lbs/day
Design population equivalent	4,167

The 1997 facility plan discusses different phases of plant upgrade and applied the phases to the design criteria. The design criteria shown in table 2 were for the "Phase one interim upgrade." A second half of phase-one would boost the maximum monthly flow to 0.75 mgd. However, the facility plan states that this expansion would not take place until the outfall was extended to the Columbia River. The assumption is that Lake River would not be able to take the additional ammonia loading from Ridgefield even with the best operations and equipment at this time. The present population listed on DMRs as 2,170 plus schools and industries.

TECHNOLOGY-BASED EFFLUENT LIMITATIONS

Municipal wastewater treatment plants are a category of discharger for which technology-based effluent limits have been promulgated by federal and state regulations. These effluent limitations are given in 40 CFR Part 133 (federal) and in Chapter 173-221 WAC (state). These regulations are performance standards that constitute all known available and reasonable methods of prevention, control, and treatment for municipal wastewater.

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The following technology-based limits for pH, fecal coliform, BOD₅, and TSS are taken from Chapter 173-221 WAC are:

Table 3: Technology-based Limits.

Parameter	Limit
pH:	shall be within the range of 6 to 9 standard units.
Fecal Coliform Bacteria	Monthly Geometric Mean = 200 organisms/100 ml Weekly Geometric Mean = 400 organisms/100 ml
BOD ₅ (concentration)	Average Monthly Limit is the most stringent of the following: - 30 mg/L - may not exceed fifteen percent (15%) of the average influent concentration Average Weekly Limit = 45 mg/L
TSS (concentration)	Average Monthly Limit is the most stringent of the following: - 30 mg/L - may not exceed fifteen percent (15%) of the average influent concentration Average Weekly Limit = 45 mg/L

The 1998 permit had a limit for chlorine, but since the disinfection system was replaced with UV. The chlorine limits have been eliminated.

The following technology-based mass limits are based on WAC 173-220-130(3)(b) and 173-221-030(11)(b).

Monthly effluent mass loadings (lbs/day) were calculated as the maximum monthly design flow (0.5 MGD) x Concentration limit (30 mg/L) x 8.34 (conversion factor) = mass limit 125 lbs/day.

The weekly average effluent mass loading is calculated as 1.5 x monthly loading = 188 lbs/day.

SURFACE WATER QUALITY-BASED EFFLUENT LIMITATIONS

In order to protect existing water quality and preserve the designated beneficial uses of Washington's surface waters, WAC 173-201A-060 states that waste discharge permits shall be conditioned such that the discharge will meet established Surface Water Quality Standards. The Washington State Surface Water Quality Standards (Chapter 173-201A WAC) is a state regulation designed to protect the beneficial uses of the surface waters of the state. Water quality-based effluent limitations may be based on an individual waste load allocation (WLA) or on a WLA developed during a basin-wide total maximum daily loading study (TMDL).

NUMERICAL CRITERIA FOR THE PROTECTION OF AQUATIC LIFE

"Numerical" water quality criteria are numerical values set forth in the state of Washington's Water Quality Standards for Surface Waters (Chapter 173-201A WAC). They specify the levels of pollutants allowed in a receiving water while remaining protective of aquatic life. Numerical criteria set forth in the Water Quality Standards are used along with chemical and physical data for the wastewater and receiving water to derive the effluent limits in the discharge permit. When surface water quality-based limits are more stringent or potentially more stringent than technology-based limitations, they must be used in a permit.

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NUMERICAL CRITERIA FOR THE PROTECTION OF HUMAN HEALTH

The state was issued 91 numeric water quality criteria for the protection of human health by the U.S. EPA (EPA 1992). These criteria are designed to protect humans from cancer and other disease and are primarily applicable to fish and shellfish consumption and drinking water from surface waters.

NARRATIVE CRITERIA

In addition to numerical criteria, "narrative" water quality criteria (WAC 173-201A-030) limit toxic, radioactive, or deleterious material concentrations below those which have the potential to adversely affect characteristic water uses, cause acute or chronic toxicity to biota, impair aesthetic values, or adversely affect human health. Narrative criteria protect the specific beneficial uses of all fresh (WAC 173-201A-130) and marine (WAC 173-201A-140) waters in the state of Washington.

ANTIDEGRADATION

The state of Washington's Antidegradation Policy requires that discharges into a receiving water shall not further degrade the existing water quality of the water body. In cases where the natural conditions of a receiving water are of lower quality than the criteria assigned, the natural conditions shall constitute the water quality criteria. Similarly, when receiving waters are of higher quality than the criteria assigned, the existing water quality shall be protected. More information on the state Antidegradation Policy can be obtained by referring to WAC 173-201A-070.

The Department has reviewed existing records and is unable to determine if ambient water quality is either higher or lower than the designated classification criteria given in Chapter 173-201A WAC; therefore, the Department will use the designated classification criteria for this water body in the proposed permit. The discharges authorized by this proposed permit should not cause a loss of beneficial uses.

CRITICAL CONDITIONS

Surface water quality-based limits are derived for the waterbody's critical condition, which represents the receiving water and waste discharge condition with the highest potential for adverse impact on the aquatic biota, human health, and existing or characteristic water body uses.

MIXING ZONES

The Water Quality Standards allow the Department to authorize mixing zones around a point of discharge in establishing surface water quality-based effluent limits. Both "acute" and "chronic" mixing zones may be authorized for pollutants that can have a toxic effect on the aquatic environment near the point of discharge. The concentration of pollutants at the boundary of these mixing zones may not exceed the numerical criteria for that type of zone. Mixing zones can only be authorized for discharges that are receiving all known, available, and reasonable methods of prevention, control and treatment (AKART) and in accordance with other mixing zone requirements of WAC 173-201A-100.

The National Toxics Rule (EPA, 1992) allows the chronic mixing zone to be used to meet human health criteria.

DESCRIPTION OF THE RECEIVING WATER

The facility discharges to Lake River which is designated as a Class A receiving water in the vicinity of the outfall. There do not appear to be any nearby point source outfalls within a mile of the Ridgefield outfall. Nearby non-point sources of pollutants may include livestock operations on tributaries that feed Lake River. There are no such operations within one mile of the Ridgefield outfall. Vancouver Lake

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receives a fair amount of urban runoff which may contribute to problems in Lake River. To the west of Lake River in the vicinity of the outfall and to several miles up and down the river is a national wildlife refuge.

Characteristic uses of Class A fresh water include the following: water supply (domestic, industrial, agricultural); stock watering; fish migration; fish rearing, spawning and harvesting; wildlife habitat; primary contact recreation; sport fishing; boating and aesthetic enjoyment; commerce and navigation.

Water quality of this class shall meet or exceed the requirements for all or substantially all uses.

SURFACE WATER QUALITY CRITERIA

Applicable criteria are defined in Chapter 173-201A WAC for aquatic biota. In addition, U.S. EPA has promulgated human health criteria for toxic pollutants (EPA 1992). Criteria for this discharge are summarized below:

Fecal Coliforms	100 organisms/100 ml maximum geometric mean
Dissolved Oxygen	8 mg/L minimum
Temperature	18 degrees Celsius maximum or incremental increases above background
pH	6.5 to 8.5 standard units
Turbidity	less than 5 NTUs above background
Toxics	No toxics in toxic amounts (see Appendix C for numeric criteria for toxics of concern for this discharge)

There are currently no TMDL studies that have been conducted for Lake River. However, the water in Lake River has serious limitations as pointed out in the Department's Environmental Assessment Program data base listing for Lake River. There has been very limited sampling of Lake River near Ridgefield (results are shown in Appendix C). There was sampling conducted from October 1991 through September 1992 for conventional parameters and metals. The Permittee conducted limited sampling for temperature and pH from 1998 through 2001, and fecal coliform, ammonia, and BOD₅ in 2002 and 2003. The Lake River summer pH had a 90th percentile of 8.43 standard units, the summer temperature had a 90th percentile of 20.53°C, and the fecal coliform had a 90th percentile of 116 org./100 ml. The Permittee will be required to conduct a water quality study and do a Priority Pollutant Scan for metals during the next permit.

CONSIDERATION OF SURFACE WATER QUALITY-BASED LIMITS FOR NUMERIC CRITERIA

Pollutant concentrations in the proposed discharge exceed water quality criteria with technology-based controls which the Department has determined to be AKART. A mixing zone is authorized in accordance with the geometric configuration, flow restriction, and other restrictions for mixing zones in Chapter 173-201A WAC and are defined as follows:

The dilution factors of effluent to receiving water that occur within these zones have been determined from the analysis shown in the 1997 Facility Plan, Appendix I. A more thorough mixing zone/dilution analysis will need to be conducted using dye tracers to confirm the presence of an eddy, quantify dilution and set a basis for computer modeling, e.g., PLUMES dilution model.

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The dilution factors determined in the Facility plan used the best information available at the time. However, the permit requirements to do another mixing study reflects our findings that there is a lot of uncertainty in the flow conditions of Lake River with the current reversals from back flooding from the Columbia River.:

	Acute	Chronic
Aquatic Life	3.0:1	17.0:1

Pollutants in an effluent may affect the aquatic environment near the point of discharge (near field) or at a considerable distance from the point of discharge (far field). Toxic pollutants, for example, are near-field pollutants--their adverse effects diminish rapidly with mixing in the receiving water. Conversely, a pollutant such as BOD is a far-field pollutant whose adverse effect occurs away from the discharge even after dilution has occurred. Thus, the method of calculating water quality-based effluent limits varies with the point at which the pollutant has its maximum effect.

The derivation of water quality-based limits also takes into account the variability of the pollutant concentrations in both the effluent and the receiving water.

The critical condition for Lake River was discussed in the 1997 Facility Plan. Because the Lake River Channel is influenced by the flows on the Columbia River, a 7Q10 low flow is not realistic. Lake River had an average flow rate of 357 cfs and a cross section of approximately 2,000 SF at low river stage. This low stage is an attempt to estimate the minimum flow. The ambient background data used for this permit includes the following (from Wallis Engineering, 1997):

Parameter	Value used
low stage flow	267 cfs (357 cfs avg high)
Velocity	0.28 – 2.0 ft/sec (flow reversals possible)
Cross section	2000 square feet
Width	240 feet
Temperature	20.53 ° C (90 th percentile)
pH (high)	8.43 (90 th percentile)
Dissolved Oxygen	8.6 mg/L (min from 1992 data)
Total Ammonia-N	0.13 mg/L (highest value used from winter data)
Fecal Coliform	15/100 ml geometric mean 116/100 ml 90 th percentile (from 11/02-1/03)
All Metals	0.0 (No samples. Assumed to be below detection)

BOD₅--Under critical conditions there is no predicted violation of the Water Quality Standards for Surface Waters. Therefore, the technology-based effluent limitation for BOD₅ was placed in the permit.

The impact of BOD on the receiving water was modeled using The Streeter Phelps DO_{ag} model at critical condition and with the technology-based effluent limitation for BOD₅ described under "Technology-Based Effluent Limitations" above (30mg/l BOD). The calculations used to determine dissolved oxygen impacts are shown in Appendix C. The model showed a final dissolved oxygen value

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of 8.43 which is drop of 0.17 mg/L using the most conservative estimates and based on the best information of ambient conditions at the present time. The final dissolved oxygen value is well above the water quality criteria of 8.0 mg/L.

Temperature and pH--The impact of the discharge on the temperature of the receiving water was modeled by simple mixing analysis at critical condition. The receiving water temperature at the critical condition is 20.53°C and the effluent temperature is 19.44°C. The effluent temperature is based on two years of summer data from 1998 and 1999. Effluent temperature has not been measured since 1999. The predicted resultant temperature at the boundary of the chronic mixing zone is 20.47°C. The calculations may be found in Appendix C, PHMIX.

Because the effluent temperature was above the water quality criteria of 18°C in both the effluent and the receiving water, there is concern of a possible water quality standards violation. It is not clear if the increased background temperature is a natural occurrence or caused by human actions. Until a TMDL is conducted, it will be assumed that the ambient temperature is higher than the natural condition. If this higher ambient temperature is a natural condition, then a 0.3°C increase above background may be allowed. We assume that if the background temperature is above the water quality criteria then the effluent needs to meet the water quality criteria at the end of the pipe. Because the temperature information is old and the facility has undergone changes, the effluent temperature may be different now. It is likely, however, that the new clarifier and UV disinfection heat up the effluent rather than cool it down. There is also the possibility that the 1000-foot long pipe from the tail of the facility to Lake River will cool the effluent slightly over this distance.

The permit will recommend more frequent and accurate temperature measurements over the life of the next permit. Continuous temperature monitors (commonly known as tidbits) should be placed in Lake River upstream of the outfall and in the effluent as close as possible to the end of the outfall. The temperature should be monitored from May through October and maximum daily temperatures reported.

The impact of pH was modeled using the calculations from EPA, 1988. The input variables were dilution factor 17, upstream temperature 20.53°C, upstream pH 8.43, upstream alkalinity 53 (as mg CaCO₃/L taken from Columbia River data), effluent temperature 19.44°C, effluent pH of 7.5 and effluent alkalinity 150 (as mg CaCO₃/L estimate based on similar facilities).

Under critical conditions there is no predicted violation of the Water Quality Standards for pH. Therefore, the technology-based effluent limitations for pH was placed in the permit.

Fecal coliform--The maximum fecal coliform value in the effluent for the last three years was 66 org./100 ml. Because the background fecal coliform is higher than the water quality standard of 100 org./100 ml, the Permittee will receive a water quality limit for fecal coliform of 100 org./100 ml for the monthly limit and 200 org./100ml for the weekly limit. This should be fairly equivalent to the water quality standards criteria for Class A waters which is a geometric mean of 100 org./100ml and not more than 10% of samples above 200 org./100 ml. Because the facility has not exceeded 66 org./100 ml in three years of operation, it does not appear that the facility will have difficulty meeting the water quality limit.

Toxic Pollutants--Federal regulations (40 CFR 122.44) require NPDES permits to contain effluent limits for toxic chemicals in an effluent whenever there is a reasonable potential for those chemicals to exceed the surface water quality criteria. This process occurs concurrently with the derivation of technology-based effluent limits. Facilities with technology-based effluent limits defined in regulation are not exempted from meeting the Water Quality Standards for Surface Waters or from having surface water quality-based effluent limits.

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A reasonable potential analysis for ammonia (See Appendix C) was conducted to determine whether or not effluent limitations would be required in this permit and found no potential. The determination of the reasonable potential for ammonia to exceed the water quality criteria was evaluated with procedures given in EPA, 1991 (Appendix C) at the critical condition. The critical condition in this case occurs during the summer months. The parameters used in the critical condition modeling are as follows: acute dilution factor 3, chronic dilution factor 17, receiving water temperature 20.5°C, and receiving water pH of 8.43. No other background pollutants have been measured.

No metals have been tested in the effluent. The Department policy is to conduct a priority pollutant scan on facilities with activated sludge systems that are the size of Ridgefield's. However, instead of a full priority pollutant scan which would examine the influent, effluent, and sludge, we are recommending a scan of heavy metals in the effluent and the receiving water. The scan for metals should be conducted once in the winter and once in the summer before the end of the permit cycle. To make sure that metals are sampled using the best "clean methods" and avoid false positives, the Permittee should follow EPA method 200.8 for sampling metals that specifies the use of Induced Coupled Plasma with Mass Spectrometry (ICP/MS). The permit will require testing of the metals listed in 40 CFR Part 122, Table III, which includes the following:

Metals and other toxic pollutants specified in 40 CFR Part 122, Appendix D, Table III

Antimony	Total
Arsenic	Total
Beryllium	Total
Cadmium	Total
Chromium	Total
Copper	Total
Lead	Total
Mercury	Total
Nickel	Total
Selenium	Total
Thallium	Total
Zinc	Total
Cyanide	Total
Phenols	Total

Mercury should be tested using EPA method 1631 Revision C which may be found in 40 CFR Part 136. This method for mercury has a minimum detection level of 0.5 ppt.

No valid ambient background data was available for any other pollutant. A determination of reasonable potential using zero for background should result in no reasonable potential. The Permittee is required in

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section S2 of the proposed permit to collect background concentrations of the metals listed above near the point of discharge. This information may result in a permit modification or limits in the next renewal.

Water quality criteria for metals in Chapter 173-201A WAC are based on the dissolved fraction of the metal.

The Permittee may provide data clearly demonstrating the seasonal partitioning of the dissolved metal in the ambient water in relation to an effluent discharge. Metals criteria may be adjusted on a site-specific basis when data is available clearly demonstrating the seasonal partitioning in the ambient water in relation to an effluent discharge.

Metals criteria may also be adjusted using the water effects ratio approach established by USEPA, as generally guided by the procedures in USEPA Water Quality Standards Handbook, December 1983, as supplemented or replaced.

WHOLE EFFLUENT TOXICITY

The Water Quality Standards for Surface Waters require that the effluent not cause toxic effects in the receiving waters. Many toxic pollutants cannot be detected by commonly available detection methods. However, toxicity can be measured directly by exposing living organisms to the wastewater in laboratory tests and measuring the response of the organisms. Toxicity tests measure the aggregate toxicity of the whole effluent, and therefore this approach is called whole effluent toxicity (WET) testing. Some WET tests measure acute toxicity and other WET tests measure chronic toxicity.

Acute toxicity tests measure mortality as the significant response to the toxicity of the effluent. Dischargers who monitor their wastewater with acute toxicity tests are providing an indication of the potential lethal effect of the effluent to organisms in the receiving environment.

Chronic toxicity tests measure various sublethal toxic responses such as retarded growth or reduced reproduction. Chronic toxicity tests often involve either a complete life cycle test of an organism with an extremely short life cycle or a partial life cycle test on a critical stage of one of a test organism's life cycles. Organism survival is also measured in some chronic toxicity tests.

In accordance with WAC 173-205-040, the Permittee's effluent has been determined to have the potential to contain toxic chemicals. The proposed permit contains requirements for whole effluent toxicity testing as authorized by RCW 90.48.520 and 40 CFR 122.44 and in accordance with procedures in Chapter 173-205 WAC. The proposed permit requires the Permittee to conduct toxicity testing for one year in order to characterize both the acute and chronic toxicity of the effluent.

If acute or chronic toxicity is measured during effluent characterization at levels that, in accordance with WAC 173-205-050(2)(a), have a reasonable potential to cause receiving water toxicity, then the proposed permit will set a limit on the acute or chronic toxicity. The proposed permit will then require the Permittee to conduct WET testing in order to monitor for compliance with either an acute toxicity limit, a chronic toxicity limit, or both an acute and a chronic toxicity limit. The proposed permit also specifies the procedures the Permittee must use to come back into compliance if the limits are exceeded.

Accredited WET testing laboratories have the proper WET testing protocols, data requirements, and reporting format. Accredited laboratories are knowledgeable about WET testing and capable of calculating an NOEC, LC₅₀, EC₅₀, IC₂₅, etc. All accredited labs have been provided the most recent version of the Department of Ecology Publication # WQ-R-95-80, *Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria* which is referenced in the permit. Any Permittee interested in receiving a copy of this publication may call the Department Publications Distribution Center (360)

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407-7472 for a copy. The Department recommends that Permittees send a copy of the acute or chronic toxicity sections(s) of their permits to their laboratory of choice.

When the WET tests during effluent characterization indicate that no reasonable potential exists to cause receiving water toxicity, the Permittee will not be given WET limits but will be required to use rapid screening tests to assure toxicity doesn't appear. If a rapid screening test indicates that toxicity has appeared, the Permittee will investigate immediately and take appropriate action.

If the Permittee makes process or material changes which, in the Department's opinion, results in an increased potential for effluent toxicity, then the Department may require additional effluent characterization in a regulatory order, by permit modification, or in the permit renewal. Toxicity is assumed to have increased if WET testing conducted in response to rapid screening tests fails to meet the performance standards in WAC 173-205-020 "whole effluent toxicity performance standard."

HUMAN HEALTH

Washington's water quality standards now include 91 numeric health-based criteria that must be considered in NPDES permits. These criteria were promulgated for the state by the U.S. EPA in its National Toxics Rule (Federal Register, Volume 57, No. 246, Tuesday, December 22, 1992).

The Department has determined that the applicant's discharge is unlikely to contain chemicals regulated for human health based on existing data or knowledge. The discharge will be re-evaluated for impacts to human health at the next permit reissuance.

A determination of the discharge's potential to cause an exceedance of the water quality standards was conducted as required by 40 CFR 122.44(d). The reasonable potential determination was evaluated with procedures given in the Technical Support Document for Water Quality-Based Toxics Control (EPA/505/2-90-001) and the Department's Permit Writer's Manual (Ecology Publication 92-109, July, 1994). The determination indicated that the discharge has no reasonable potential to cause a violation of water quality standards, thus an effluent limit is not warranted.

COMPARISON OF EFFLUENT LIMITS WITH THE EXISTING PERMIT ISSUED AUGUST 12, 1998

Parameter	Existing Limits		Proposed Limits	
	Monthly Limits	Weekly Limits	Monthly Limits	Weekly Limits
BOD, and TSS	30 mg/L 88 lbs/day (interim) 125 lbs/day (final) and 85% removal	45 mg/L 132 lbs/day (interim) 188 lbs/day (final)	30 mg/L 125 lbs/day and 85% removal	45 mg/L 188 lbs/day
Fecal Coliform Bacteria	200/100 ml	400/100 ml	100/100 ml (geomean)	200/100ml (geomean)
pH	Shall not be outside the range 6.0 to 9.0		Shall not be outside the range 6.0 to 9.0	
Total Residual	Minimized (interim)		Not applicable	

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Chlorine	Not applicable (final)	
Ammonia (NH₃-N)	Optimize plant operation for nitrification and monitor	No limit

The final limits shown above in the 1998 permit were to become final after the submittal of the Declaration of Construction of Water Pollution Control Facilities and lasting through the expiration date of the permit.

MONITORING REQUIREMENTS

Monitoring, recording, and reporting are required (WAC 173-220-210 and 40 CFR 122.41) to verify that the treatment process is functioning correctly and the effluent limitations are being achieved.

Monitoring for oil and grease and metals is being required to further characterize the effluent. Metals that need to be examined are those listed in 40 CFR Part 122, appendix D, table III. These metals are listed above under the discussion of Toxic Pollutants. These pollutants could have a significant impact on the quality of the surface water.

Monitoring of sludge quantity and quality is necessary to determine the appropriate uses of the sludge. Sludge monitoring is required by the current state and local solid waste management program and also by EPA under 40 CFR 503.

The monitoring schedule is detailed in the proposed permit under Condition S.2. Specified monitoring frequencies take into account the quantity and variability of discharge, the treatment method, past compliance, significance of pollutants, and cost of monitoring. The required monitoring frequency is consistent with agency guidance given in the current version of the Department's *Permit Writer's Manual* (July 1994) for an activated sludge facility that is less than 2.0 MGD average design flow.

LAB ACCREDITATION

With the exception of certain parameters the permit requires all monitoring data to be prepared by a laboratory registered or accredited under the provisions of Chapter 173-50 WAC, *Accreditation of Environmental Laboratories*. The laboratory at this facility is accredited for general chemistry which includes BOD/COD, total residual chlorine, dissolved oxygen, pH, and solids, total suspended. Ammonia and fecal coliform must be tested in a different laboratory and are currently being tested at the Salmon Creek laboratory.

OTHER PERMIT CONDITIONS

REPORTING AND RECORDKEEPING

The conditions of S3 are based on the authority to specify any appropriate reporting and recordkeeping requirements to prevent and control waste discharges (WAC 173-220-210).

PREVENTION OF FACILITY OVERLOADING

Overloading of the treatment plant is a violation of the terms and conditions of the permit. To prevent this from occurring, RCW 90.48.110 and WAC 173-220-150 require the Permittee to take the actions detailed in proposed permit requirement S.4 to plan expansions or modifications before existing capacity

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is reached and to report and correct conditions that could result in new or increased discharges of pollutants. Condition S.4 restricts the amount of flow.

OPERATION AND MAINTENANCE (O&M)

The proposed permit contains Condition S.5 as authorized under RCW 90.48.110, WAC 173-220-150, Chapter 173-230 WAC, and WAC 173-240-080. It is included to ensure proper operation and regular maintenance of equipment, and to ensure that adequate safeguards are taken so that constructed facilities are used to their optimum potential in terms of pollutant capture and treatment.

RESIDUAL SOLIDS HANDLING

To prevent water quality problems the Permittee is required in permit Condition S7 to store and handle all residual solids (grit, screenings, scum, sludge, and other solid waste) in accordance with the requirements of RCW 90.48.080 and State Water Quality Standards.

The final use and disposal of sewage sludge (biosolids) from this facility is regulated by U.S. EPA under 40 CFR 503, and by the Department under Chapter 70.95J RCW and Chapter 173-308 WAC. The WWTP as a biosolids generator, is required to obtain coverage under the General Statewide Permit for Biosolids Management. The disposal of other solid waste is under the jurisdiction of the Clark County Health Department.

PRETREATMENT

Federal and State Pretreatment Program Requirements

Under the terms of the addendum to the "Memorandum of Understanding between Washington Department of Ecology and the United States Environmental Protection Agency, Region 10" (1986), the Department has been delegated authority to administer the Pretreatment Program [i.e., act as the Approval Authority for oversight of delegated Publicly Owned Treatment Works (POTWs)]. Under this delegation of authority, the Department has exercised the option of issuing wastewater discharge permits for significant industrial users discharging to POTWs which have not been delegated authority to issue wastewater discharge permits.

There are a number of functions required by the Pretreatment Program which the Department is delegating to such POTWs because they are in a better position to implement the requirements (e.g. tracking the number and general nature of industrial dischargers to the sewerage system). The requirements for a Pretreatment Program are contained in Title 40, part 403 of the Code of Federal Regulations. Under the requirements of the Pretreatment Program [40 CFR 403.8(f)(1)(iii)], the Department is required to approve, condition, or deny new discharges or a significant increase in the discharge for existing significant industrial users (SIUs) [40 CFR 403.8 (f)(1)(i)].

The Department is responsible for issuing State Waste Discharge Permits to SIUs and other industrial users of the Permittee's sewer system. Industrial dischargers must obtain these permits from the Department prior to the Permittee accepting the discharge [WAC 173-216-110(5)] (Industries discharging wastewater that is similar in character to domestic wastewater are not required to obtain a permit. Such dischargers should contact the Department to determine if a permit is required.). Industrial dischargers need to apply for a State Waste Discharge Permit 60 days prior to commencing discharge. The conditions contained in the permits will include any applicable conditions for categorical discharges, loading limitations included in contracts with the POTW, and other conditions necessary to assure compliance with State water quality standards and biosolids standards.

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The Department requires this POTW to fulfill some of the functions required for the Pretreatment Program in the NPDES permit (e.g., tracking the number and general nature of industrial dischargers to the sewage system). The POTW's NPDES permit will require that all SIUs currently discharging to the POTW be identified and notified of the requirement to apply for a wastewater discharge permit from the Department. None of the obligations imposed on the POTW relieve an industrial or commercial discharger of its primary responsibility for obtaining a wastewater discharge permit (if required), including submittal of engineering reports prior to construction or modification of facilities [40 CFR 403.12(j) and WAC 173-216-070 and WAC 173-240-110, et seq.].

Wastewater Permit Required

RCW 90.48 and WAC 173-216-040 require SIUs to obtain a permit prior to discharge of industrial waste to the Permittee's sewerage system. This provision prohibits the POTW from accepting industrial wastewater from any such dischargers without authorization from the Department.

Requirements for Routine Identification and Reporting of Industrial Users

The NPDES permit requires non-delegated POTWs to "take continuous, routine measures to identify all existing, new, and proposed SIUs and potential significant industrial users (PSIUs) discharging to the Permittee's sewerage system." Examples of such routine measures include regular review of business tax licenses for existing businesses and review of water billing records and existing connection authorization records. System maintenance personnel can also be diligent during performance of their jobs in identifying and reporting as-yet unidentified industrial dischargers. Local newspapers, telephone directories, and word-of-mouth can also be important sources of information regarding new or existing discharges. The POTW is required to notify an industrial discharger, in writing, of their responsibilities regarding application for a state waste discharge permit and to send a copy of the written notification to the Department. The Department will then take steps to solicit a State waste discharge permit application.

Submittal of List of Industrial Users

This provision requires the POTW to submit once per permit cycle a list of existing and proposed SIUs and PSIUs. This requirement is intended to update the Department on the status of industrial users in the POTW's service area, without requiring the POTW to go through the process of performing a formal Industrial User Survey. This provision is normally applied to POTWs not serving industrial or commercial users. Although this permit does not require performance of an Industrial User Survey, the Permittee is nevertheless required under the previous section, to take adequate continuous routine measures to identify existing and new industrial discharges.

Duty to Enforce Discharge Prohibitions

This provision prohibits the POTW from authorizing or permitting an industrial discharger to discharge certain types of waste into the sanitary sewer. The first portion of the provision prohibits acceptance of pollutants which cause pass-through or interference. The definitions of pass through and interference are in Appendix B of the fact sheet..

The second portion of this provision prohibits the POTW from accepting certain specific types of wastes, namely those which are explosive, flammable, excessively acidic, basic, otherwise corrosive, or obstructive to the system. In addition wastes with excessive BOD, petroleum based oils, or which result in toxic gases are prohibited to be discharged. The regulatory basis for these prohibitions is 40 CFR Part 403, with the exception of the pH provisions which are based on WAC 173-216-060.

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The third portion of this provision prohibits certain types of discharges unless the POTW receives prior authorization from the Department. The discharges include cooling water in significant volumes, stormwater and other direct inflow sources, and wastewaters significantly affecting system hydraulic loading, which do not require treatment.

Support by the Department for Developing Partial Pretreatment Program by POTW

The Department has committed to providing technical and legal assistance to the Permittee in fulfilling these joint obligations, in particular assistance with developing an adequate sewer use ordinance, notification procedures, enforcement guidelines, and developing local limits and inspection procedures.

EFFLUENT MIXING STUDY

The Department has estimated the amount of mixing of the discharge within the authorized mixing zone to determine the potential for violations of the Water Quality Standards for Surface Waters (Chapter 173-201A WAC). Condition S8 of this permit requires the Permittee to more accurately determine the mixing characteristics of the discharge. Mixing will be measured or modeled under conditions specified in the permit to assess whether assumptions made about dilution will protect the receiving water quality outside the allotted dilution zone boundary. As noted earlier in this fact sheet, the dilution is based on assumptions about Lake River that should be confirmed or disproved through an actual mixing study. Very little is known about tide reversals, and low flow conditions in Lake River and likely cannot be shown without dye studies. The dilution ratios determined for this fact sheet were fairly small.

The modeling should be re-run with the assumption of a diffuser at the end of the now 10" pipe. The modeling should be done after the on-site dilution mixing study has been conducted. A previous dilution modeling showed that adding a six-inch constriction to the outfall should improve the dilution. A tide-flex diffuser or multi-port diffuser should be modeled with the new assumptions gained from the dye study. If the modeling shows the diffuser improves dilution, recommendations should be made for installing a diffuser.

A review of study plans by the Department will be required prior the Permittee's consultants conducting a study.

OUTFALL EVALUATION

Proposed permit Condition S12 requires the Permittee to conduct an outfall inspection and submit a report detailing the findings of that inspection once during the permit. The purpose of the inspection is to determine the condition of the discharge pipe and diffusers (if added) and to determine if sediment is accumulating in the vicinity of the outfall.

GENERAL CONDITIONS

General Conditions are based directly on state and federal law and regulations and have been standardized for all individual municipal NPDES permits issued by the Department.

PERMIT ISSUANCE PROCEDURES

PERMIT MODIFICATIONS

The Department may modify this permit to impose numerical limitations, if necessary to meet Water Quality Standards, Sediment Quality Standards, or Ground Water Standards, based on new information

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obtained from sources such as inspections, effluent monitoring, outfall studies, and effluent mixing studies.

The Department may also modify this permit as a result of new or amended state or federal regulations.

RECOMMENDATION FOR PERMIT ISSUANCE

This proposed permit meets all statutory requirements for authorizing a wastewater discharge, including those limitations and conditions believed necessary to protect human health, aquatic life, and the beneficial uses of waters of the state of Washington. The Department proposes that this permit be issued for five years.

REFERENCES FOR TEXT AND APPENDICES

Environmental Protection Agency (EPA)

1992. National Toxics Rule. Federal Register, V. 57, No. 246, Tuesday, December 22, 1992.
1991. Technical Support Document for Water Quality-based Toxics Control. EPA/505/2-90-001.
1988. Technical Guidance on Supplementary Stream Design Conditions for Steady State Modeling. USEPA Office of Water, Washington, D.C.
1985. Water Quality Assessment: A Screening Procedure for Toxic and Conventional Pollutants in Surface and Ground Water. EPA/600/6-85/002a.
1983. Water Quality Standards Handbook. USEPA Office of Water, Washington, D.C.

Metcalf and Eddy.

1991. Wastewater Engineering, Treatment, Disposal, and Reuse. Third Edition.

Tsivoglou, E.C., and J.R. Wallace.

1972. Characterization of Stream Reaeration Capacity. EPA-R3-72-012. (Cited in EPA 1985 op.cit.)

Wallis Engineering.

1997. Facility Plan for the City of Ridgefield, Washington. Final. WE660D

Washington State Department of Ecology.

Laws and Regulations(<http://www.ecy.wa.gov/laws-rules/index.html>)

Permit and Wastewater Related Information

(<http://www.ecy.wa.gov/programs/wq/wastewater/index.html>)

Washington State Department of Ecology.

1994. Permit Writer's Manual. Publication Number 92-109

Water Pollution Control Federation.

1976. Chlorination of Wastewater.

Wright, R.M., and A.J. McDonnell.

1979. In-stream Deoxygenation Rate Prediction. Journal Environmental Engineering Division, ASCE. 105(E2). (Cited in EPA 1985 op.cit.)

APPENDIX A--PUBLIC INVOLVEMENT INFORMATION

The Department has tentatively determined to reissue a permit to the applicant listed on page 1 of this fact sheet. The permit contains conditions and effluent limitations which are described in the rest of this fact sheet.

Public notice of application was published on July 14, 2002, and July 21, 2002, in the *Columbian* to inform the public that an application had been submitted and to invite comment on the reissuance of this permit.

The Department will publish a Public Notice of Draft (PNOD) on October 29, 2003, in the *Columbian* to inform the public that a draft permit and fact sheet are available for review. Interested persons are invited to submit written comments regarding the draft permit. The draft permit, fact sheet, and related documents are available for inspection and copying between the hours of 8:00 a.m. and 5:00 p.m. weekdays, by appointment, at the regional office listed below. Written comments should be mailed to:

Water Quality Permit Administrator
Department of Ecology
Southwest Regional Office
P.O. Box 47775
Olympia, WA 98504-7775.

Any interested party may comment on the draft permit or request a public hearing on this draft permit within the 30-day comment period to the address above. The request for a hearing shall indicate the interest of the party and the reasons why the hearing is warranted. The Department will hold a hearing if it determines there is a significant public interest in the draft permit (WAC 173-220-090). Public notice regarding any hearing will be circulated at least 30 days in advance of the hearing. People expressing an interest in this permit will be mailed an individual notice of hearing (WAC 173-220-100).

Comments should reference specific text followed by proposed modification or concern when possible. Comments may address technical issues, accuracy and completeness of information, the scope of the facility's proposed coverage, adequacy of environmental protection, permit conditions, or any other concern that would result from issuance of this permit.

The Department will consider all comments received within 30 days from the date of public notice of draft indicated above, in formulating a final determination to issue, revise, or deny the permit. The Department's response to all significant comments is available upon request and will be mailed directly to people expressing an interest in this permit.

Further information may be obtained from the Department by telephone, (360) 407-6554, or by writing to the address listed above.

This permit and fact sheet were written by Eric Schlorff.

APPENDIX B--GLOSSARY

Acute Toxicity--The lethal effect of a pollutant on an organism that occurs within a short period of time, usually 48 to 96 hours.

AKART-- An acronym for "all known, available, and reasonable methods of prevention, control, and treatment".

Ambient Water Quality--The existing environmental condition of the water in a receiving water body.

Ammonia--Ammonia is produced by the breakdown of nitrogenous materials in wastewater. Ammonia is toxic to aquatic organisms, exerts an oxygen demand, and contributes to eutrophication. It also increases the amount of chlorine needed to disinfect wastewater.

Average Monthly Discharge Limitation --The highest allowable average of daily discharges over a calendar month, calculated as the sum of all daily discharges measured during a calendar month divided by the number of daily discharges measured during that month (except in the case of fecal coliform). The daily discharge is calculated as the average measurement of the pollutant over the day.

Average Weekly Discharge Limitation -- The highest allowable average of daily discharges over a calendar week, calculated as the sum of all daily discharges measured during a calendar week divided by the number of daily discharges measured during that week. The daily discharge is calculated as the average measurement of the pollutant over the day.

Best Management Practices (BMPs)--Schedules of activities, prohibitions of practices, maintenance procedures, and other physical, structural and/or managerial practices to prevent or reduce the pollution of waters of the State. BMPs include treatment systems, operating procedures, and practices to control: plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. BMPs may be further categorized as operational, source control, erosion and sediment control, and treatment BMPs.

BOD₅--Determining the Biochemical Oxygen Demand of an effluent is an indirect way of measuring the quantity of organic material present in an effluent that is utilized by bacteria. The BOD₅ is used in modeling to measure the reduction of dissolved oxygen in a receiving water after effluent is discharged. Stress caused by reduced dissolved oxygen levels makes organisms less competitive and less able to sustain their species in the aquatic environment. Although BOD is not a specific compound, it is defined as a conventional pollutant under the federal Clean Water Act.

Bypass--The intentional diversion of waste streams from any portion of a treatment facility.

CBOD₅ – The quantity of oxygen utilized by a mixed population of microorganisms acting on the nutrients in the sample in an aerobic oxidation for five days at a controlled temperature of 20 degrees Celsius, with an inhibitory agent added to prevent the oxidation of nitrogen compounds. The method for determining CBOD₅ is given in 40 CFR Part 136.

Chlorine--Chlorine is used to disinfect wastewaters of pathogens harmful to human health. It is also extremely toxic to aquatic life.

Chronic Toxicity--The effect of a pollutant on an organism over a relatively long time, often 1/10 of an organism's lifespan or more. Chronic toxicity can measure survival, reproduction or growth rates, or other parameters to measure the toxic effects of a compound or combination of compounds.

Clean Water Act (CWA)--The Federal Water Pollution Control Act enacted by Public Law 92-500, as amended by Public Laws 95-217, 95-576, 96-483, 97-117; USC 1251 et seq.

Combined Sewer Overflow (CSO)--The event during which excess combined sewage flow caused by inflow is discharged from a combined sewer, rather than conveyed to the sewage treatment plant because either the capacity of the treatment plant or the combined sewer is exceeded.

Compliance Inspection - Without Sampling--A site visit for the purpose of determining the compliance of a facility with the terms and conditions of its permit or with applicable statutes and regulations.

Compliance Inspection - With Sampling--A site visit to accomplish the purpose of a Compliance Inspection - Without Sampling and as a minimum, sampling and analysis for all parameters with limits in the permit to ascertain compliance with those limits; and, for municipal facilities, sampling of influent to ascertain compliance with the percent removal requirement. Additional sampling may be conducted.

Composite Sample--A mixture of grab samples collected at the same sampling point at different times, formed either by continuous sampling or by mixing a minimum of four discrete samples. May be "time-composite"(collected at constant time intervals) or "flow-proportional" (collected either as a constant sample volume at time intervals proportional to stream flow, or collected by increasing the volume of each aliquot as the flow increased while maintaining a constant time interval between the aliquots).

Construction Activity--Clearing, grading, excavation and any other activity which disturbs the surface of the land. Such activities may include road building, construction of residential houses, office buildings, or industrial buildings, and demolition activity.

Continuous Monitoring --Uninterrupted, unless otherwise noted in the permit.

Critical Condition--The time during which the combination of receiving water and waste discharge conditions have the highest potential for causing toxicity in the receiving water environment. This situation usually occurs when the flow within a water body is low, thus, its ability to dilute effluent is reduced.

Dilution Factor--A measure of the amount of mixing of effluent and receiving water that occurs at the boundary of the mixing zone. Expressed as the inverse of the effluent fraction e.g., a dilution factor of 10 means the effluent comprises 10% by volume and the receiving water 90%.

Engineering Report--A document which thoroughly examines the engineering and administrative aspects of a particular domestic or industrial wastewater facility. The report shall contain the appropriate information required in WAC 173-240-060 or 173-240-130.

Fecal Coliform Bacteria--Fecal coliform bacteria are used as indicators of pathogenic bacteria in the effluent that are harmful to humans. Pathogenic bacteria in wastewater discharges are controlled by disinfecting the wastewater. The presence of high numbers of fecal coliform bacteria in a water body can indicate the recent release of untreated wastewater and/or the presence of animal feces.

Grab Sample--A single sample or measurement taken at a specific time or over as short period of time as is feasible.

Industrial User-- A discharger of wastewater to the sanitary sewer which is not sanitary wastewater or is not equivalent to sanitary wastewater in character.

Industrial Wastewater--Water or liquid-carried waste from industrial or commercial processes, as distinct from domestic wastewater. These wastes may result from any process or activity of industry, manufacture, trade or business, from the development of any natural resource, or from animal operations such as feed lots, poultry houses, or dairies. The term includes contaminated storm water and, also, leachate from solid waste facilities.

Infiltration and Inflow (I/I)--"Infiltration" means the addition of ground water into a sewer through joints, the sewer pipe material, cracks, and other defects. "Inflow" means the addition of precipitation-caused drainage from roof drains, yard drains, basement drains, street catch basins, etc., into a sewer.

Interference -- A discharge which, alone or in conjunction with a discharge or discharges from other sources, both:

Inhibits or disrupts the POTW, its treatment processes or operations, or its sludge processes, use or disposal and;

Therefore is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation) or of the prevention of sewage sludge use or disposal in compliance with the following statutory provisions and regulations or permits issued thereunder (or more stringent State or local regulations): Section 405 of the Clean Water Act, the Solid Waste Disposal Act (SWDA) (including title II, more commonly referred to as the Resource Conservation and Recovery Act (RCRA), and including State regulations contained in any State sludge management plan prepared pursuant to subtitle D of the SWDA), sludge regulations appearing in 40 CFR Part 507, the Clean Air Act, the Toxic Substances Control Act, and the Marine Protection, Research and Sanctuaries Act.

Major Facility--A facility discharging to surface water with an EPA rating score of > 80 points based on such factors as flow volume, toxic pollutant potential, and public health impact.

Maximum Daily Discharge Limitation--The highest allowable daily discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. The daily discharge is calculated as the average measurement of the pollutant over the day.

Method Detection Level (MDL)--The minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is above zero and is determined from analysis of a sample in a given matrix containing the analyte.

Minor Facility--A facility discharging to surface water with an EPA rating score of < 80 points based on such factors as flow volume, toxic pollutant potential, and public health impact.

Mixing Zone--A volume that surrounds an effluent discharge within which water quality criteria may be exceeded. The area of the authorized mixing zone is specified in a facility's permit and follows procedures outlined in State regulations (Chapter 173-201A WAC).

National Pollutant Discharge Elimination System (NPDES)--The NPDES (Section 402 of the Clean Water Act) is the Federal wastewater permitting system for discharges to navigable waters of the United States. Many states, including the State of Washington, have been delegated the authority to issue these permits. NPDES permits issued by Washington State permit writers are joint NPDES/State permits issued under both State and Federal laws.

Pass through -- A discharge which exits the POTW into waters of the--State in quantities or concentrations which, alone or in conjunction with a discharge or discharges from other sources, is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation), or which is a cause of a violation of State water quality standards.

pH--The pH of a liquid measures its acidity or alkalinity. A pH of 7 is defined as neutral, and large variations above or below this value are considered harmful to most aquatic life.

Potential Significant Industrial User--A potential significant industrial user is defined as an Industrial User which does not meet the criteria for a Significant Industrial User, but which discharges wastewater meeting one or more of the following criteria:

- a. Exceeds 0.5 % of treatment plant design capacity criteria and discharges <25,000 gallons per day or;
- b. Is a member of a group of similar industrial users which, taken together, have the potential to cause pass through or interference at the POTW (e.g. facilities which develop photographic film or paper, and car washes).

The Department may determine that a discharger initially classified as a potential significant industrial user should be managed as a significant industrial user.

Quantitation Level (QL)-- A calculated value five times the MDL (method detection level).

Significant Industrial User (SIU)--

- 1) All industrial users subject to Categorical Pretreatment Standards under 40 CFR 403.6 and 40 CFR Chapter I, Subchapter N and;
- 2) Any other industrial user that: discharges an average of 25,000 gallons per day or more of process wastewater to the POTW (excluding sanitary, noncontact cooling, and boiler blow-down wastewater); contributes a process wastestream that makes up 5 percent or more of the average dry weather hydraulic or organic capacity of the POTW treatment plant; or is designated as such by the Control Authority* on the basis that the industrial user has a reasonable potential for adversely affecting the POTW's operation or for violating any pretreatment standard or requirement (in accordance with 40 CFR 403.8(f)(6)).

Upon finding that the industrial user meeting the criteria in paragraph 2, above, has no reasonable potential for adversely affecting the POTW's operation or for violating any pretreatment standard or requirement, the Control Authority* may at any time, on its own initiative or in response to a petition received from an industrial user or POTW, and in accordance with 40 CFR 403.8(f)(6), determine that such industrial user is not a significant industrial user.

*The term "Control Authority" refers to the Washington State Department of Ecology in the case of non-delegated POTWs or to the POTW in the case of delegated POTWs.

State Waters--Lakes, rivers, ponds, streams, inland waters, underground waters, salt waters, wetlands, and all other surface waters and watercourses within the jurisdiction of the state of Washington.

Stormwater--That portion of precipitation that does not naturally percolate into the ground or evaporate, but flows via overland flow, interflow, pipes, and other features of a storm water drainage system into a defined surface water body, or a constructed infiltration facility.

Technology-based Effluent Limit--A permit limit that is based on the ability of a treatment method to reduce the pollutant.

Total Suspended Solids (TSS)--Total suspended solids are the particulate materials in an effluent. Large quantities of TSS discharged to a receiving water may result in solids accumulation. Apart from any toxic effects attributable to substances leached out by water, suspended solids may kill fish, shellfish, and other aquatic organisms by causing abrasive injuries and by clogging the gills and respiratory passages of various aquatic fauna. Indirectly, suspended solids can screen out light and can promote and maintain the development of noxious conditions through oxygen depletion.

Upset--An exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the Permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, lack of preventative maintenance, or careless or improper operation.

Water Quality-based Effluent Limit--A limit on the concentration or mass of an effluent parameter that is intended to prevent the concentration of that parameter from exceeding its water quality criterion after it is discharged into a receiving water.

APPENDIX C--TECHNICAL CALCULATIONS

Several of the Excel® spreadsheet tools used to evaluate a discharger's ability to meet Washington State water quality standards can be found on the Department's homepage at <http://www.ecy.wa.gov/programs/wq/wastewater/index.html>

This spreadsheet calculates the reasonable potential to exceed state water quality standards for a small number of samples. The procedure and calculations are done per the procedure in Technical Support Document for Water Quality-based Toxics Control, U.S. EPA, March, 1991 (EPA/505/2-90-001) on page 56. User input columns are shown with red headings. Corrected formulas in col G and H on 5/98 (GB)

Parameter	Metal Criteria Translator as decimal		Ambient Concentration (metals as dissolved) ug/L	State Water Quality Standard		Max concentration at edge of...		LIMIT REQ'D?
	Acute	Chronic		Acute	Chronic	Acute Mixing Zone	Chronic Mixing Zone	
	ug/L	ug/L		ug/L	ug/L	ug/L	ug/L	
Ammonia	1.00	1.00	130.0000	2100.0000	340.0000	300.25	160.04	NO

CALCULATIONS

Effluent percentile value	Pn	Max effluent conc. measured (metals as total recoverable) ug/L	Coeff Variation CV	s	# of samples n	Multiplier	Acute Dil'n Factor	Chronic Dil'n Factor	COMMENTS
0.95	0.933	590.00	0.60	0.55	43	1.09	3	17	

Calculation Of Ammonia Concentration and Criteria for fresh water.

Based on EPA Quality Criteria for Water (EPA 400/5-86-001) and WAC 173-201A. Revised 1-5-94 (corrected)

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total ammonia criterion). Revised 3/10/95 to calculate chronic criteria in accordance with EPA Memorandum from Heber to WQ Stds Coordinators dated July 30, 1992.

INPUT

1. Ambient Temperature (deg C; 0<T<30)	20.5
2. Ambient pH (6.5<pH<9.0)	8.43
3. Acute TCAP (Salmonids present- 20; absent- 25)	20
4. Chronic TCAP (Salmonids present- 15; absent- 20)	15

OUTPUT

1. Intermediate Calculations:	
Acute FT	1.00
Chronic FT	1.41
FPH	1.00
RATIO	14
pKa	9.38
Fraction Of Total Ammonia Present As Un-ionized	10.0018%
2. Un-ionized Ammonia Criteria	
Acute (1-hour) Un-ionized Ammonia Criterion (ug NH3/L)	260.0
Chronic (4-day) Un-ionized Ammonia Criterion (ug NH3/L)	42.0
3. Total Ammonia Criteria:	
Acute Total Ammonia Criterion (mg NH3+ NH4/L)	2.6
Chronic Total Ammonia Criterion (mg NH3+ NH4/L)	0.4
4. Total Ammonia Criteria expressed as Nitrogen:	
Acute Ammonia Criterion as mg N	2.1
Chronic Ammonia Criterion as N	0.34

**Lake River Ambient Conditions
from City of Ridgefield**

DATE	FECAL COLIFORM	NH3-N	BOD
10/1/02			3.3
11/5/2002	10	0.06	1
11/7/2002	16	0.04	1
11/12/2002	1		1.1
11/14/2002	44	0.107	1
11/19/2002	43	0.017	1
11/21/2002	1	0.001	1.2
11/26/2002	23	0.001	
12/3/2002	27	0.06	
12/5/2002	48	0.001	0.51
12/10/2002	33	0.001	1.02
12/12/2002	35	0.02	2.1
12/17/2002		0.04	2.2

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12/19/2002	108	0.03	0
12/25/2002		0.001	0.8
12/26/2002	74	0.13	
12/27/2002	92		1.4
1/2/2003	1	0.06	1.4
1/3/2003	1	0.06	
1/7/2003	120	0.09	1
1/9/2003	66	0.07	1
1/14/2003	366	0.09	1
1/16/2003	136	0.08	1.3
1/21/2003	2.3	0.04	1
1/23/2003	1	0.04	1
1/28/2003	3	0.03	1
1/31/2003	1	0.05	1.1

geomean	max value		
15.13415	0.13		
90 th	90 th	90 th	
percentile	percentile	percentile	
116.4	0.09	1.89	

Streeter-Phelps analysis of critical dissolved oxygen sag.

Based on Lotus File DOSAG2.WK1 Revised 19-Oct-93

INPUT

1. EFFLUENT CHARACTERISTICS

Discharge (cfs): (0.5 mgd):	0.77
CBOD5 (mg/L):	30
NBOD (mg/L):	13
Dissolved Oxygen (mg/L):	2
Temperature (deg C):	18

2. RECEIVING WATER CHARACTERISTICS

Upstream Discharge (cfs):	267
Upstream CBOD5 (mg/L):	1.9
Upstream NBOD (mg/L):	0.81
Upstream Dissolved Oxygen (mg/L):	8.6
Upstream Temperature (deg C):	20.53
Elevation (ft NGVD):	25
Downstream Average Channel Slope (ft/ft):	0.00088
Downstream Average Channel Depth (ft):	8.3

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Downstream Average Channel Velocity (fps): 1.05

3. REAERATION RATE (Base e) AT 20 deg C (day⁻¹): 3.57

Reference	Applic. Vel (fps)	Applic. Dep (ft)	Suggested Values
Churchill	1.5 - 6	2 - 50	0.35
O'Connor and Dobbins	.1 - 1.5	2 - 50	0.56
Owens	.1 - 6	1 - 2	0.44
Tsivoglou-Wallace	.1 - 6	.1 - 2	3.83

4. BOD DECAY RATE (Base e) AT 20 deg C (day⁻¹): 0.67

Reference	Suggested Value
Wright and McDonnell, 1979	0.67

OUTPUT

1. INITIAL MIXED RIVER CONDITION

CBOD5 (mg/L):	2.0
NBOD (mg/L):	0.8
Dissolved Oxygen (mg/L):	8.6
Temperature (deg C):	20.5

2. TEMPERATURE ADJUSTED RATE CONSTANTS (Base e)

Reaeration (day ⁻¹):	3.61
BOD Decay (day ⁻¹):	0.69

3. CALCULATED INITIAL ULTIMATE CBODU AND TOTAL BODU

Initial Mixed CBODU (mg/L):	2.9
Initial Mixed Total BODU (CBODU + NBOD, mg/L):	3.7

4. INITIAL DISSOLVED OXYGEN DEFICIT

Saturation Dissolved Oxygen (mg/L):	8.991
Initial Deficit (mg/L):	0.41

5. TRAVEL TIME TO CRITICAL DO CONCENTRATION (days): 0.35

6. DISTANCE TO CRITICAL DO CONCENTRATION (miles): 6.05

7. CRITICAL DO DEFICIT (mg/L): 0.56

8. CRITICAL DO CONCENTRATION (mg/L):

8.43

Calculation of pH of a mixture of two flows. Based on the procedure in EPA's DESCON program (EPA, 1988. Technical Guidance on Supplementary Stream Design Conditions for Steady State Modeling. USEPA Office of Water, Washington D.C.)

Based on Lotus File PHMIX2.WK1 Revised 19-Oct-93

INPUT

1. DILUTION FACTOR AT MIXING ZONE BOUNDARY	17.000
1. UPSTREAM/BACKGROUND CHARACTERISTICS	
Temperature (deg C):	20.53
pH:	8.43
Alkalinity (mg CaCO3/L):	53.00
2. EFFLUENT CHARACTERISTICS	
Temperature (deg C):	19.44
pH:	7.50
Alkalinity (mg CaCO3/L):	150.00

OUTPUT

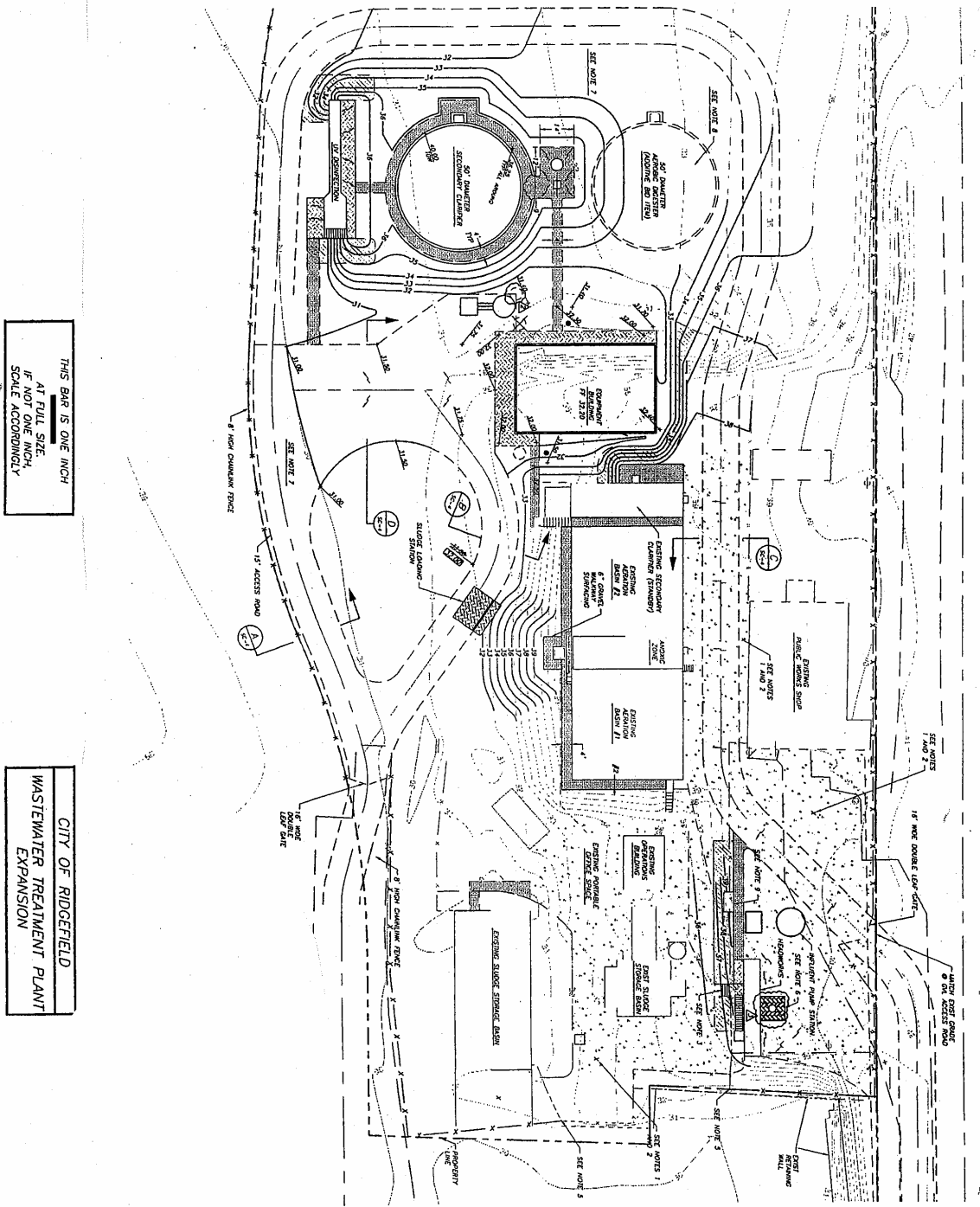
1. IONIZATION CONSTANTS	
Upstream/Background pKa:	6.38
Effluent pKa:	6.39
2. IONIZATION FRACTIONS	
Upstream/Background Ionization Fraction:	0.99
Effluent Ionization Fraction:	0.93
3. TOTAL INORGANIC CARBON	
Upstream/Background Total Inorganic Carbon (mg CaCO3/L):	53.47
Effluent Total Inorganic Carbon (mg CaCO3/L):	161.54

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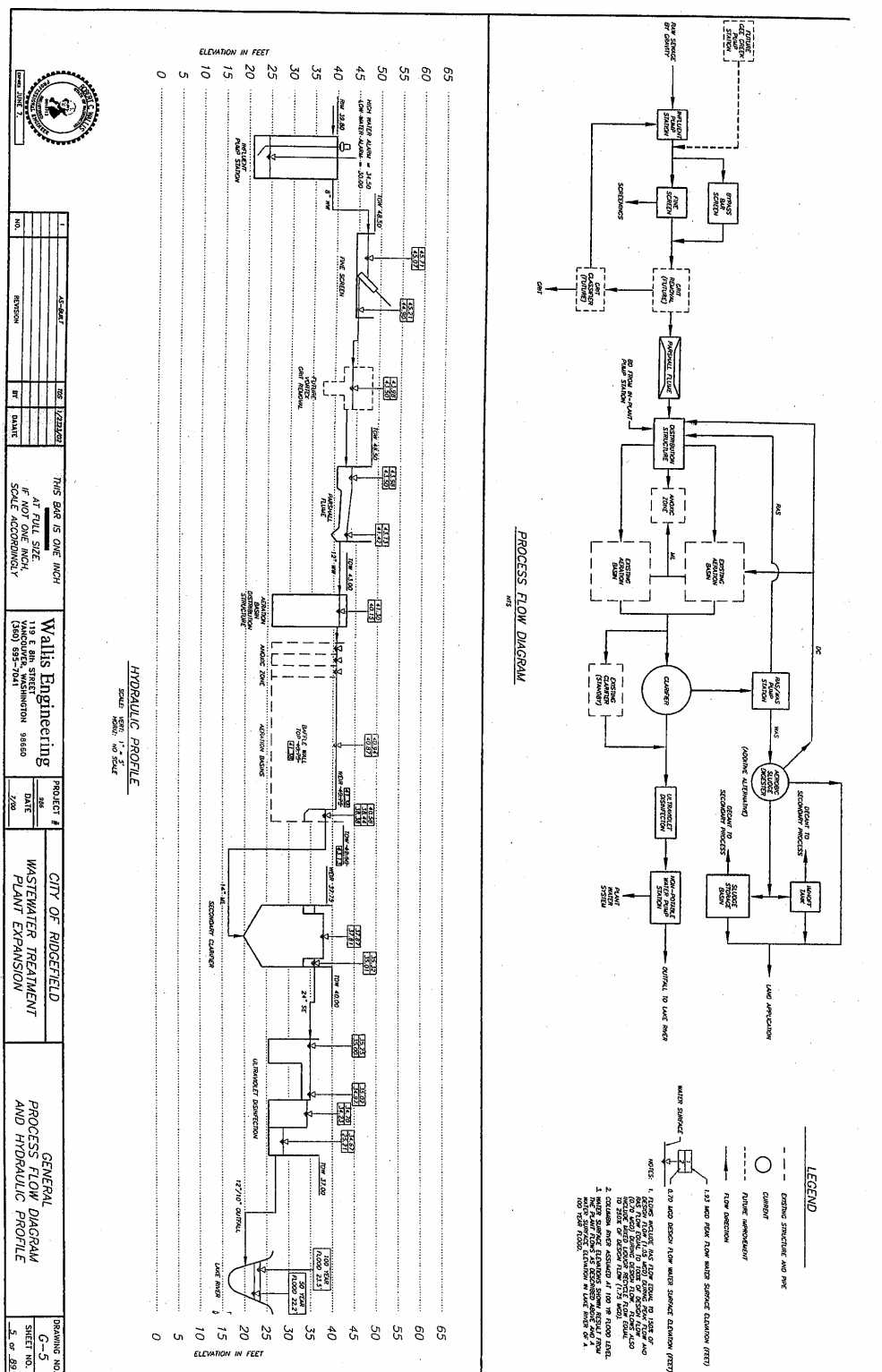
4. CONDITIONS AT MIXING ZONE BOUNDARY

Temperature (deg C):	20.47
Alkalinity (mg CaCO ₃ /L):	58.71
Total Inorganic Carbon (mg CaCO ₃ /L):	59.83
pKa:	6.38
pH at Mixing Zone Boundary:	8.10

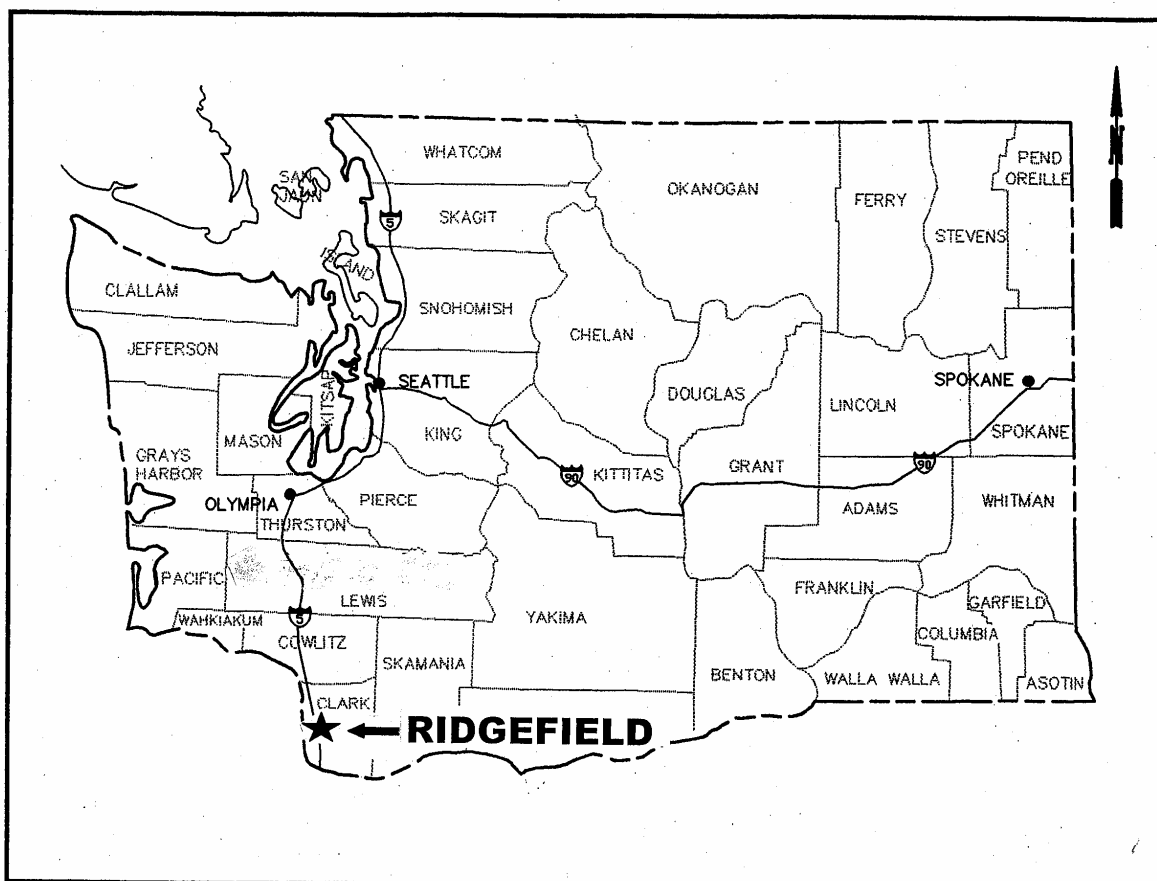
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VICINITY MAP
NOT TO SCALE

APPENDIX D--RESPONSE TO COMMENTS

Comments from the City of Ridgefield, November 20, 2003, with responses from the Department

Comment 1:

Special Conditions S1 and S4 list limit for BOD, TSS, and flow based upon information from the 1997 Facility Plan rather than the actual expanded plant design criteria. During the final design process, a lot of effort was made to size new facilities to optimize future expansion possibilities. This resulted in changes from the criteria outlined in the facility plan. An entire series of Design Memoranda (24 total) were prepared during the design, which were shared with DOE and which summarized the construction plans that were approved by DOE. A reduced-size copy of construction plans sheet G-4 is enclosed for reference.

Response 1:

Plans and Specifications are reviewed for conformity with an approved Facility Plan. This review is intended to evaluate whether the plans describe a facility sufficient to meet the minimum criteria for sizing and reliability in the facility plan. Slight increases to component sizes in the Plans and Specifications are not sufficient, by themselves, to increase the facility plan's rated capacity. Figure 11 of the approved Final Facilities Plan approved February 27, 1997, shows the "Proposed 0.5 MGD interim expansion" designed for a maximum monthly flow of 0.5 MGD. The facility does not include a discharge to the Columbia River. This discharge to the Columbia River is necessary for the facility to exceed 0.5 MGD. Figure 11A of the same Facilities Plan shows the same facility with the outfall and pump station necessary for discharge to the Columbia River and a capacity of 0.75 MGD for the maximum monthly average flow. There are no additional treatment components. Page 9-7 of the plan explains why: "To reduce the debt requirements, an interim upgrade is proposed which would correct the serious deficiencies that exist at the plant, and provide nitrification so that the current outfall to Lake River could be utilized for several more years." This upgrade is for 0.5 MGD as shown on Figure 11 but does not meet the Department requirement of discharging to the Columbia River, which is needed to increase the discharge to 0.7 MGD.

NOTE: Why the plan shows 0.7 MGD, not 0.75 MGD once they discharge to the Columbia -- Both of these plans were to include the 55-foot diameter clarifier of Figures 10 and 10A. The Referenced sheet G-4 shows a clarifier of only 50-foot in diameter was installed. A 55-foot diameter clarifier has a 21 percent larger surface area than a 50-foot clarifier. Since clarifiers are sized on surface area, this may explain why sheet G-4 shows only a 0.7 MGD capacity instead of a 0.75 MGD capacity. While the Department may accept the 0.7 MGD capacity (a seven percent decrease in capacity from the 0.75 MGD capacity planned for phase I) this highlights the need for Ridgefield to revise their Facility Plans more frequently when such changes are made. Further, Page 8-6 of the approved Facility Plan expresses the intention to use the other existing clarifier, clarifier #2 as a redundant clarifier to satisfy reliability requirements during the first phase. A recent Department inspection found that this reliability does not currently exist. One clarifier was converted to sludge digestion and the other was retrofitted and is in use, rather than being kept in standby condition. This change created the need to construct an additional clarifier to meet redundancy requirements at the same time as the discharge to the Columbia.

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It should also be noted that other alternatives for final effluent disposition exist—including water reuse. However, such a change in plans would require an amendment of the existing General Sewer Plan/Facility Plan and review and approval by the Departments of Ecology and Health to ensure that the requirement of the state's reclaimed water standards are met.

Comment 2:

The City requests that the new permit be based on these criteria that reflect the actual treatment plant rather than the outdated Facility Plan data. The BOD and TSS limits should be 175 lbs/day and 263 lbs/day average monthly and weekly, respectively, and the average flow for the maximum month should be 0.70 mgd.

Response 2:

The City has only constructed the interim upgrade portion of the phase I facility, a phase noted to achieve a 0.5 MGD capacity. The City has yet to accomplish the construction of the outfall to the Columbia River necessary to realize full phase I capacity. Because of that lack of outfall to the Columbia, the City continues to discharge to a point that requires a higher degree of treatment. This correspondingly reduces the POTWs capacity to 0.5 MGD (MMA). While sheet G-4 is inconsistent with the Facility Plan in that it recognizes a 0.7 MGD flow at the end of construction, it is not unusual for plans and specifications to report the hydraulic capacity of components that will be accomplished when other actions are also completed. In this case, the Facility Plan clarifies that the 0.7 MGD flow capacity will be achieved when the outfall to the Columbia River is constructed. It is, however, important that the plans reflect that this was a downgrade from 0.75 MGD previously anticipated at the completion of phase I. If the new criteria showed a 0.75 MGD capacity when the outfall line to the Columbia is completed, this should be lowered to 0.70 MGD based on this comment and the evidence provided.

Comment 3:

The City asks that the mixing zone analysis Plan of Study required in S8.A be submitted for review a month later (March 15, 2004, instead of February 15, 2004).

Response 3:

The due date will be changed to May 15, 2004, to allow adequate time after permit issuance.

Comment 4:

The City asks that the Effluent Mixing Report required in S8.B be submitted for review two months later (January 15, 2005, instead of November 15, 2004).

Response 4:

This change in date is acceptable and will be made.

Comment 5:

The City asks the Design Criteria on page 5 of the Fact Sheet be updated to meet with their understanding of the design criteria.

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Response 5:

The only appropriate change is to downgrade full phase I capacity from 0.75 MGD to 0.70 MGD, if the discharge is to the Columbia. Until discharge is removed from Lake River, the capacity must be held at 0.5 MGD. The rationale for not changing the capacity of the facility at its current discharge point is included in the response to items 1 and 2 above. Furthermore the lack of clarifier redundancy would also be critical to this decision and is further necessary to realize full phase I capacity.

Comment 6:

The Description of the Receiving Water section on page 7 of the Fact Sheet should also describe the conditions occurring upstream in the Whipple Creek, Salmon Creek, and Burnt Bridge Creek basins, and Vancouver Lake with its flushing channel from the Columbia River. It should be noted that these upstream conditions have a major and substantial impact on the quality of Lake River before it reaches the City's outfall. A realistic assessment should be made of these conditions as they relate to the potential impact from the City's treatment plant effluent as the required treatment levels are established. To establish standardized requirements at considerable public expense based on a general assumption of some beneficial result when such is improbable is not in the public's interest. Further study may be conducted in the future through a TMDL. However, no TMDL is scheduled for these waters at this time and may not reveal anything new or different for the Ridgefield discharge.

Response 6:

The permit fact sheet includes information important to permit decisions. It is not intended to capture all the data that may be relevant to a water cleanup plan or other more involved study of the ambient environment. While such information as the City describes may be important to such a plan it is not relevant to the development of an NPDES permit—only the receiving water conditions and the effluent quality needed to prevent further degradation of the ambient environment are evaluated.